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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,493	11/19/2003	Yoshiaki Kobuke	245682US0	5954

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EXAMINER

FEDOWITZ, MATTHEW L

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/715,493	Applicant(s) KOBUE ET AL.	
	Examiner Matthew L. Fedowitz	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 7 and 8 is/are rejected.
- 7) ☒ Claim(s) 2, 4 and 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/19/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

✓

DETAILED ACTION

Claims 1-8 are pending in this action.

Objections

Claims 2, 4 and 6 are objected to as depending from a rejected base claim. These claims would be allowable if rewritten in independent form with all the limitations pertaining thereto.

The claims would be allowable if rewritten as directed because the prior art does not anticipate or suggest that which is set forth.

The information disclosure is objected to because the pages entitled "list of related cases" are not contained on the proper form 1449. As a result these references have not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 8 use the phrase "exhibiting a large two-photon absorption property" without defining what "large" is. The specification does not provide consistent direction as to what this term means within this context and can be interpreted in many ways thereby rendering the claim indefinite. For purposes of examination, the term "large" will be interpreted as meaning any two-photon absorption property.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

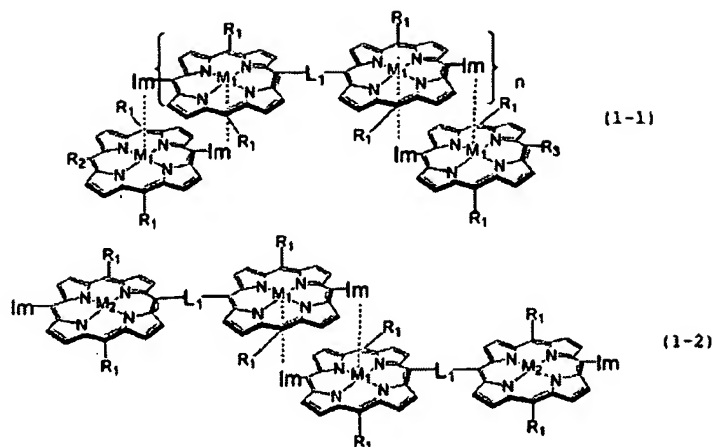
A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 3, 5 and 7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 3 and 13 of copending Application No. 2003/0187251 A1 in view of Screen *et al.* and Ogawa *et al.*

Claims 1, 3, 5 and 7 are drawn to a porphyrin array exhibiting a large two-photon absorption property being linked by an acetylinic bond as shown below

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Where R_1 represents a substituted or un-substituted alkyl group or a substituted or un-substituted aryl group; where M_1 represents a metal ion capable of serving as a core metal of the porphyrin ring and forming a coordinate bond with the imidazolyl group represented by Im; where M_2 represents either two protons or a metal ion incapable of forming a coordinate bond with the imidazolyl group represented by Im; where R_2 and R_3 may be the same or different, and each independently represent a group selected from a group of a porphyrin residue without a core metal or porphyrin complex residue having a core metal represented by M_1 or M_2 , a cyclic diimide residue, a dialkylviologen residue, a benzoquinone residue, an N-methylpyrrolidine-fullerene derivative residue and a ferrocene residue; where Im is an imidazolyl group as in Im₂; where R_8 represents a methyl group or hydrogen atom; where L_1 represents a linking group represented by $(-C\equiv C-)_m$; where m is 1 to 3 and where n represents 1 or more. Further, where the metal is selected from zinc, iron, cobalt, ruthenium and gallium and where the number of carbon atoms in the alkyl and aryl groups in R_1 is 1-24 and 6-24 respectively. Still further, a method of

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preparing the porphyrin array above by reacting an imidazolyl porphyrin metal complex, in the presence of a polar solvent with an imidazolyl porphyrin metal complex.

As relating to claim 1, Kobuke et al. (US 2003/0187251 A1) teach a porphyrin array exhibiting a two photon absorption property linked with an acetylinic bond where R_1 represents a substituted or un-substituted alkyl group or a substituted or un-substituted aryl group (see claim 1); where M_1 represents a metal ion capable of serving as a core metal of the porphyrin ring and forming a coordinate bond with the imidazolyl group represented by Im and M_2 represents either two protons or a metal ion incapable of forming a coordinate bond with the imidazolyl group represented by Im (see claims 1 and 2). M_2 does not have to be different and thus is taught in claims 1 and 2. Further, where R_2 and R_3 may be the same or different, and each independently represent a group selected from a group of a porphyrin residue with out a core metal or porphyrin complex residue having a core metal represented by M_1 or M_2 , a cyclic diimide residue, a dialkylviologen residue, a benzoquinone residue, an N-methylpyrrolidine-fullerene derivative residue and a ferrocene residue; where Im is an imidazolyl group as in Im₂ a; where R_8 represents a methyl group or hydrogen atom (see claims 1 and 2).

As relating to claim 3, Kobuke et al. (US 2003/0187251 A1) teach a porphyrin array where M_1 is an ion of metal selected from zinc, iron, cobalt, ruthenium and gallium (see claim 2).

As relating to claim 5, Kobuke et al. (US 2003/0187251 A1) teach a porphyrin array where the number of carbon atoms in the alkyl and aryl groups in R_1 is 1-24 and 6-24 respectively (see claim 3).

Kobuke et al. (US 2003/0187251 A1) does not teach L_1 where there is a linking group represented by $(-C\equiv C-)_m$ where m represents an integer of 1 to 3.

Screen *et al.* teach a porphyrin array where the porphyrin complexes are linked by groups such as $(-C\equiv C-)$ (see p. 9712 Scheme 1). The teachings of Screen *et al.* demonstrate that porphyrin complexes may be linked to together by such groups as $(-C\equiv C-)$.

The motivation to combine these teachings is found in Ogawa *et al.* and Screen *et al.* Ogawa *et al.* teaches that porphyrin array systems that are extended should have excellent photo-physical properties of a chlorophyll substitute that enable the transfer of excitation energy (see p. 4070). And to provide this stabilization Screen *et al.* teaches a method assembling double-stranded conjugated porphyrin polymer ladders (see p.9712). Thus, with these teachings in hand, one skilled in the art would be motivated to develop methods to increase stability of the porphyrin arrays. By forming arrays with linking groups such as $(-C\equiv C-)$ the stability and photo-physical properties of porphyrin arrays would be increased.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings above to obtain the compound as claimed in the instant application. All of the moieties, which are substituted in the instant application, are taught in the art, and the locations of substitution are correlative with the locations of substitution in the art. Obviousness based on similarity of structure and functions entails motivation to make the claimed compound in expectation that compounds similar in structure will have similar properties; therefore, one of ordinary skill in the art would be motivated to make the claimed compounds in searching for new porphyrin compounds. See *In re Payne*, 203 USPQ 245 (CCPA 1979).

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As relating claim 7, Kobuke *et al.* (US 2003/0187251 A1) teach a method of preparing a porphyrin array with the limitations as described above by reacting an imidazolyl porphyrin metal complex, in the presence of a polar solvent with an imidazolyl porphyrin metal complex (see claim 13).

Kobuke *et al.* (US 2003/0187251 A1) does not teach a method where the compound contains L_1 represented by $(-C\equiv C-)_m$ where m represents an integer of 1 to 3. The method though is not directed to preparing porphyrin compounds with linking groups such as $(-C\equiv C-)$ because it is directed to preparing the array and using those compounds with such linking groups as starting compounds.


Therefore, in obtaining the starting material to form such arrays, one would be motivated to combine the teachings of Kobuke *et al.* and Screen *et al.*, as described above, with the motivation provided by Ogawa *et al.* and Screen *et al.* as described above because it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings above to obtain the method as claimed in the instant application. This is because all of the moieties, which are substituted in the instant application, are taught in the art, and the locations of substitution are correlative with the locations of substitution in the art. As such, obviousness based on similarity of structure and functions entails motivation to make the claimed compound in expectation that compounds similar in structure will have similar properties; therefore, one of ordinary skill in the art would be motivated to use the claimed compounds as starting materials in searching for methods to make porphyrin arrays.

This is a provisional obviousness-type double patenting rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew L. Fedowitz whose telephone number is (571) 272-3105. If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, James O. Wilson, can be reached on (571) 272-0661. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew L. Fedowitz, Pharm.D., J.D.
November 9, 2004



James O. Wilson
Supervisory Patent Examiner
Art Unit 1623